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WHAT IS CLAIMED IS:

1. Apparatus for generating a fluid flow, said apparatus comprising:
- 5    -- a displacement pump
- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,
- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the
- 10    fluid flow, and
- with a support means for holding the flow vessel; and
- a measuring arrangement responsive to the displacement motions performed by the flow vessel,
- with a pressure sensor for sensing a static pressure in
- 15    the fluid and providing a sensor signal representative of the displacement motions, and
- with evaluation electronics for the sensor signal.
2. Apparatus as claimed in claim 1, wherein the evaluation
- 20    electronics are being operable to derive from the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.
3. Apparatus as claimed in claim 1, wherein the evaluation
- 25    electronics are being operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.
4. Apparatus as claimed in claim 1, wherein the evaluation
- 30    electronics are being operable to derive from the sensor signal a volume estimate representative of a totalized volume of fluid delivered.

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5. Apparatus as claimed in claim 1, wherein the evaluation electronics are being operable to derive from the sensor signal a status signal representative of a current  
5 operational status of the displacement pump.
6. Apparatus as claimed in claim 1, wherein the evaluation electronics are being operable to derive from the sensor signal a second measurement signal representative of a  
10 suction head of the apparatus.
7. Apparatus as claimed in claim 1, wherein the pump drive is a rotary pump drive.
- 15 8. Apparatus as claimed in claim 1, wherein the pump drive is a linear pump drive.
9. A sampler with an apparatus for generating a fluid flow, said apparatus comprising:  
20 -a displacement pump  
-- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,  
-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the  
25 fluid flow, and  
-- with a support means for holding the flow vessel; and  
-a measuring arrangement responsive to the displacement motions performed by the flow vessel,  
-- with a pressure sensor for sensing a static pressure in  
30 the fluid and providing a sensor signal representative of the displacement motions, and  
-- with evaluation electronics for the sensor signal.

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10. Sampler as claimed in claim 9, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a flow rate estimate representative of an  
5 instantaneous volume flow rate of the fluid.

11. Sampler as claimed in claim 9, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a first measurement signal representative of a  
10 frequency of the displacement motions.

12. Sampler as claimed in claim 9, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a volume estimate representative of a totalized  
15 volume of fluid delivered.

13. Sampler as claimed in claim 9, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a status signal representative of a current  
20 operational status of the displacement pump.

14. Sampler as claimed in claim 9, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a second measurement signal representative of a  
25 suction head of the apparatus.

15. Sampler as claimed in claim 9, wherein the pump drive  
is a rotary pump drive.

30 16. Sampler as claimed in claim 9, wherein the pump drive  
is a linear pump drive.

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17. Sampler as claimed in claim 9, wherein said Sampler is a mobile Sampler

18. Sampler as claimed in claim 9, wherein said Sampler is  
5 a portable Sampler

19. Apparatus for generating a fluid flow, said apparatus comprising:

- a displacement pump
- 10 -- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,
- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and
- 15 -- with a support means for holding the flow vessel,  
--- the flow vessel being compressed by the pump drive in operation temporarily and in sections and forced against the support means such that the support means is elastically strained; and
- 20 -a measuring arrangement responsive to the displacement motions performed by the flow vessel,
- with a strain sensor for sensing a strain of the support means and providing a sensor signal representative of the displacement motions performed by the flow vessel,
- 25 and
- with evaluation electronics for the sensor signal.

20. Apparatus as claimed in claim 19, wherein the evaluation electronics are being operable to derive from  
30 the sensor signal a flow rate estimate representative of an instantaneous volume flow rate of the fluid.

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21. Apparatus as claimed in claim 19, wherein the evaluation electronics are being operable to derive from the sensor signal a first measurement signal representative of a frequency of the displacement motions.

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22. Apparatus as claimed in claim 19, wherein the evaluation electronics are being operable to derive from the sensor signal a volume estimate representative of a totalized volume of fluid delivered.

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23. Apparatus as claimed in claim 19, wherein the evaluation electronics are being operable to derive from the sensor signal a status signal representative of a current operational status of the displacement pump.

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24. Apparatus as claimed in claim 19, wherein the pump drive is a rotary pump drive.

25. Apparatus as claimed in claim 19, wherein the pump drive is a linear pump drive.

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26. A sampler with an apparatus for generating a fluid flow, said apparatus comprising:

- a displacement pump

25 -- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow, and

30 -- with a support means for holding the flow vessel,

--- the flow vessel being compressed by the pump drive in operation temporarily and in sections and forced

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against the support means such that the support means  
is elastically strained; and

- a measuring arrangement responsive to the displacement  
motions performed by the flow vessel,

5 -- with a strain sensor for sensing a strain of the support  
means and providing a sensor signal representative of  
the displacement motions performed by the flow vessel,  
and

-- with evaluation electronics for the sensor signal.

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27. Sampler as claimed in claim 26, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a flow rate estimate representative of an  
instantaneous volume flow rate of the fluid.

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28. Sampler as claimed in claim 26, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a first measurement signal representative of a  
frequency of the displacement motions.

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29. Sampler as claimed in claim 26, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a volume estimate representative of a totalized  
volume of fluid delivered.

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30. Sampler as claimed in claim 26, wherein the evaluation  
electronics are being operable to derive from the sensor  
signal a status signal representative of a current  
operational status of the displacement pump.

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31. Sampler as claimed in claim 26, wherein the pump drive  
is a rotary pump drive.

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32. Sampler as claimed in claim 26, wherein the pump drive is a linear pump drive.

5 33. Sampler as claimed in claim 26, wherein said Sampler is a mobile Sampler

34. Sampler as claimed in claim 26, wherein said Sampler is a portable Sampler

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35. Method of monitoring an apparatus serving to generate a fluid flow and comprising:

- a displacement pump

-- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

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-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow,

-- with a drive motor for the pump drive, and

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-- with a support means for holding the flow vessel; and

- a measuring arrangement responsive to the displacement motions of the flow vessel and comprising a pressure sensor for sensing a static pressure in the fluid,

said method comprising the steps of:

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- causing drive motions of the drive motor for producing the displacement motions of the flow vessel;

- sensing the pressure with the pressure sensor for generating a sensor signal representative of the displacement motions; and

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- deriving from the sensor signal a status signal signaling a current operational status of the apparatus.

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36. Method of monitoring a sampler with an apparatus serving to generate a fluid flow, said apparatus comprising:

- a displacement pump

5 -- with at least one flow vessel of deformable lumen, which serves to conduct a fluid,

-- with a pump drive for producing displacement motions of the flow vessel which deform the lumen and cause the fluid flow,

10 -- with a drive motor for the pump drive, and

-- with a support means for holding the flow vessel; and

- a measuring arrangement responsive to the displacement motions of the flow vessel and comprising a pressure sensor for sensing a static pressure in the fluid,

15 said method comprising the steps of:

- causing drive motions of the drive motor for producing the displacement motions of the flow vessel;

- sensing the pressure with the pressure sensor for generating a sensor signal representative of the

20 displacement motions; and

- deriving from the sensor signal a status signal signaling a current operational status of the apparatus.